

# ***Headquarters U.S. Air Force***

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## **AF ESPC UPDATE**



**J. Michael Cross, PE, CEM  
AFCESA Energy Support Team  
Northrop Grumman Mission Systems**

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## **AF Situation for Energy Goals**

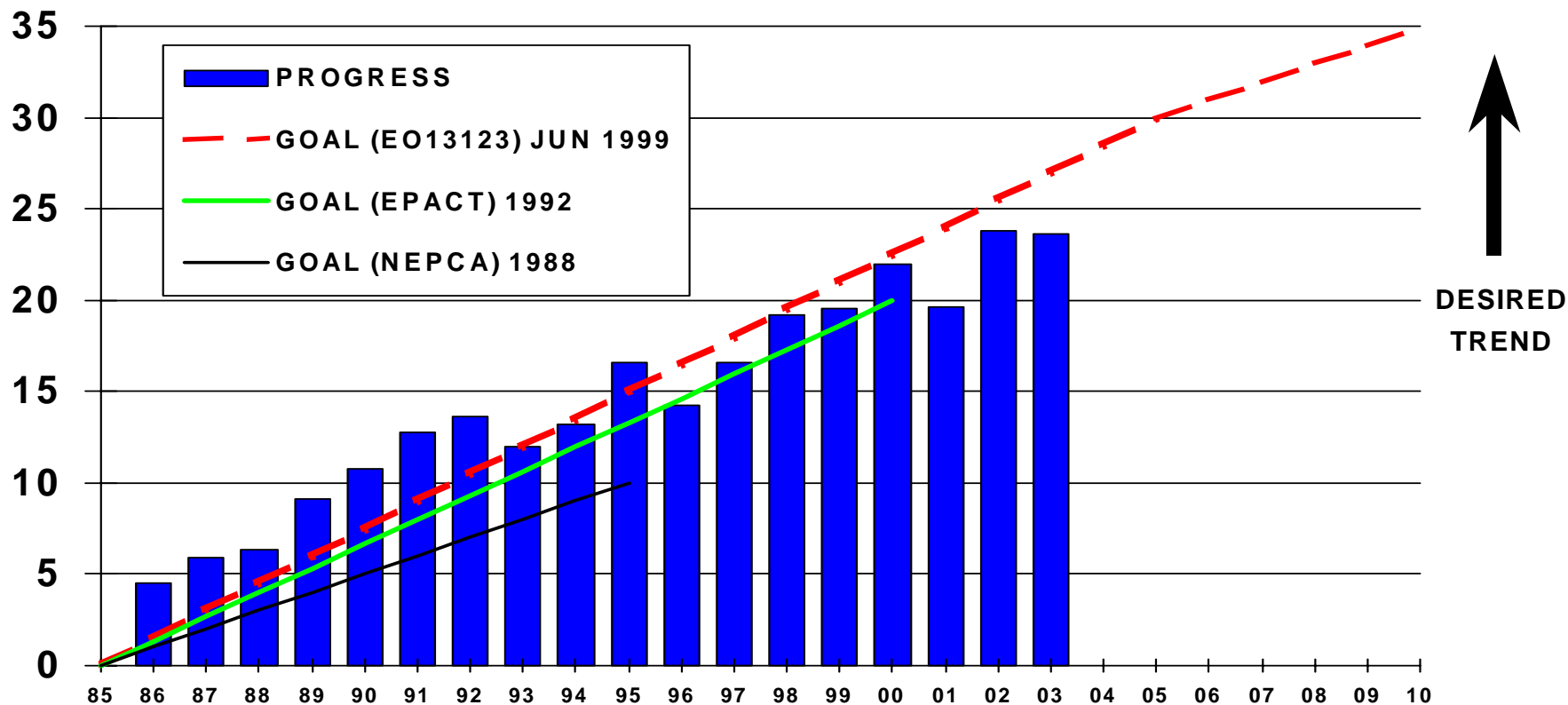


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**FY 03 PROGRESS = 23.6%**

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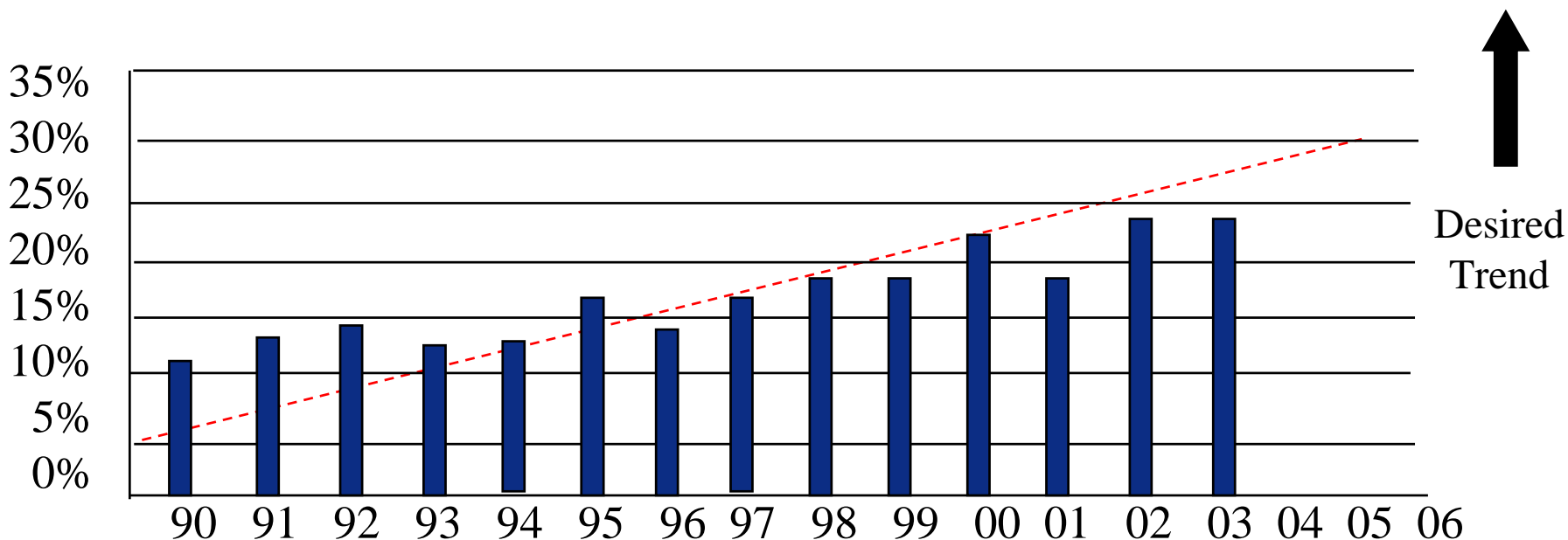


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# Energy Savings Goals (Annual Targets)

■ Progress  
- - - Goal (EO13123) Jun 1999

**FY03 PROGRESS = 23.6%**





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# ***FY 03 USAF Facility Energy Consumption***

**78.7 trillion BTU's**

**\$793.3 million**





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# *AWARDED ESPC PROJECTS*

## *FY 03*

BASE	MAJCOM	ESCO	Award Date	Awarded TO Total Contractor Investment	Awarded TO Total AF Payments to Contractor Over Life of TO
Dyess	ACC	Siemens	24 Sep 03	\$3,602,557	\$6,137,680
Dyess(Mod)	ACC	Siemens	06 Jan 04	\$7,094,449	\$11,547,571
NAS JRB	Navy	Siemens	20 Jun 03	\$3,736,350	\$6,171,959
Travis (Mod)	AMC	Honeywell	11 July 03	\$3,209,966	\$7,043,651



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# *AWARDED ESPC PROJECTS*

## *FY 03*

BASE	MAJCOM	ESCO	Award Date	Awarded TO Total Contractor Investment	Awarded TO Total AF Payments to Contractor Over Life of TO
Hill	AFMC	Sempra	30 Sep 03	\$2,769,750	\$5,665,597
Hill	AFMC	Exelon	30 Sep 03	\$4,610,585	\$16,562,688
Kirtland	AFMC	Honeywell	26 Mar 03	\$2,195,000	\$7,980,339
Nellis	ACC	JCI	26 Sep 03	\$4,201,696	\$9,943,491
Beale	ACC	Chevron Tex	30 Sep 03	\$3,659,095	\$6,539,665
Elmendorf	PACAF	AMERESCO	29 Sep 03	\$48,841,031	\$123,605,931
Ramstein	USAFE	Siemens	31 Jul 03	\$1,623,074	\$3,648,475

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## **AF Position on Impact of Sunset Provision**



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# ***Sunset Language***

## **42 USC 8287 (c), Sunset Provision**

- **"The authority to enter into NEW contracts under this section shall cease to be effective on October 1, 2003."**



# ***AFCESA DETERMINATION***

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- **FAR Part 2, Definition for a delivery order is:**
  - **An order for supplies placed against an ESTABLISHED contract or with Government sources."**
  - **FAR Part 2 makes clear that task/delivery orders are not contracts themselves, but orders placed "against an established contract."**
- **Task/delivery orders are not considered by the AF to be "new contracts" under the Sunset Provision at 42 USC 8287(c) and, therefore, does not limit task order issuance after 30 Sept 03**



# ***AFCESA DETERMINATION***

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- **Plain reading of 42 USC 8287 shows that entering into a contract" is contemplated to mean implementing the full blown procedures to "select and monitor" energy service contractors**
- **The AF does not engage in this process each time a task/delivery order is issued. The legislative intent of Congress on this particular issue is silent so the plain reading and FAR references should be followed**
- **The AF will continue to issue task orders against existing AF Regional ESPC contracts**



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# ***Status of FY 04 Awards***

## **■ AWARDED**

- Kunsan AFB    value \$1.5 MILLION**
- Osan AFB        value \$3.5 MILLION**

## **■ PENDING**

- Mountain Home AFB    value \$2 MILLION**

## **■ IN PROCESS Mid CY AWARD Anticipated**

- Altus AFB                    value \$2.5 MILLION**
- Lackland AFB            value \$0.9 MILLION**
- Laughlin AFB            value \$2.2 MILLION**

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## **AF ESPC M&V PROTOTYPE UPDATE**



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# ***Development of M&V Prototypes***

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## **■ GOALS OF DEVELOPMENT PROCESS**

- **Holistic Approach**
- **Cost Effective M&V**
- **Designed to Acquire and Maintain Savings for Installations**
- **Designed to Accelerate Implementation**
- **AFCESA introducing standard M&V Plans to address 80% of the needs**



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# ***AF M&V, PROTOTYPE***

## **■ DEVELOPMENT CONSIDERATIONS**

- Measurements Start to Finish**
- Step-by-Step Development of the Process**
- Realistic Expectations**
- Realistic Measurements**
- Affordable Cost**
- Writer Friendly**
- Reader Friendly**
- Alternate Methods of Proof**
- Future Generations**
- Living Document**
- Requirements of 42 USC 8287**



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# ***Development of M&V Prototypes***

- **AFCESA / TAMU DEVELOPED MASTER M&V FORMAT**
  - Received USAF ESCO input
- **STATUS**
  - Six M&V prototypes posted to the HW AFCESA public website since 8 April 04
  - Two M&V prototypes reviewed but not finalized or posted to website
  - Three M&V prototypes received but not reviewed
  - Remaining M&V prototypes in progress
- **AFCESA WEBSITE ACCESS**

[http://www.afcesa.af.mil/ces/cesm/energy/cesm\\_prototypes.asp](http://www.afcesa.af.mil/ces/cesm/energy/cesm_prototypes.asp)





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# ***Development of M&V Prototypes***

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- **ECP M&V PROTOTYPES Posted to Website**

[http://www.afcesa.af.mil/ces/cesm/energy/cesm\\_prototypes.asp](http://www.afcesa.af.mil/ces/cesm/energy/cesm_prototypes.asp)

- **EMCS**
- **Boilers**
- **Chillers**
- **Lighting**
- **Variable Speed Drives**
- **Constant Speed High Efficiency Motors**



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# ***Development of M&V Prototypes***

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- **ECP PROTOTYPES WAITING FINALIZATION**
  - **Decentralization of Heating Plant**
  - **Central Chiller Plant**



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# ***Development of M&V Prototypes***

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- **ECP PROTOTYPES IN REVIEW**
  - **Propane Air**
  - **Cooling Tower Replacement**
  - **Direct Expansion/Heat Pump Replacement**



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# ***Development of M&V Prototypes***

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- **FUTURE ECP PROTOTYPES**
  - **Thermal Storage systems**
  - **Building Envelope**
  - **Infrared Heating**
  - **Steam Traps**
  - **Plate Heat Exchangers**
  - **FM Control Systems**
  - **HVAC Controls/Retrofit**



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# ***Development of M&V Prototypes***

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- **TARGET DATE FOR COMPLETION**

- **30 SEPT 04**

- **WEBSITE (again)**

[http://www.afcesa.af.mil/ces/cesm/energy/cesm\\_prototypes.asp](http://www.afcesa.af.mil/ces/cesm/energy/cesm_prototypes.asp)

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## **M&V PROTOTYPE EXAMPLE**



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# ***AF M&V, LIGHTING***

- 1. Measurement and Verification Summary**
- 2. Pre ECP Baseline Development**
  - 2.1. Pre ECP Energy Baseline**
  - 2.2. This Paragraph not used**
  - 2.3. Documentation of Baseline Utility Rates**
  - 2.4. Pre ECP O&M Cost Estimates (when applicable)**



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# ***AF M&V, LIGHTING***

## **3. ECP Requirements / Proposal**

### **3.1. ECP Description**

### **3.2. Predicted Post ECP Yearly Costs – Utility Usage**

### **3.3. Predicted Post ECP O&M Costs**

## **4. Yearly Savings – Utility and O&M**

### **4.1. Annual Utility Savings**

### **4.2. Predicted Utility Cost Savings**

### **4.3. Predicted Yearly O&M Cost Savings**

### **4.4. Predicted Total ECP Cost Savings (Utility and O&M)**

### **4.5. Guaranteed Savings**





## **5. Acceptance**

**5.1. Acceptance Criteria – System Performance Requirements**

**5.2. Performance Criteria – Detailed Descriptions**

**5.3. Performance Acceptance Tests - Detailed Descriptions**

**5.3.1. Efficiency Tests**

**5.3.2. Capacity Tests**

**5.4. Measurement Equipment Used**

**5.5. Acceptance Checklist**

**5.5.1. Acceptance Documents**



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# ***AF M&V, LIGHTING***

## **6. Periodic / Interval Verification Activities**

### **6.1. ECP Executive Overview**

### **6.2. Contact Information**

### **6.3 Year 1 Requirements**

#### **6.3.1. System Performance Criteria**

#### **6.3.2. System Performance Tests**

#### **6.3.3. Energy Performance Criteria**

#### **6.3.4. Energy Performance Tests**

#### **6.3.5. O&M Validation**



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# ***AF M&V, LIGHTING***

## **6.4 Year 1+N Requirements**

**6.4.1. System Performance Criteria**

**6.4.2. System Performance Tests**

**6.4.3. Energy Performance Criteria**

**6.4.4. Energy Performance Tests**

**6.4.5. O&M Validation**



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# ***AF M&V, LIGHTING***

- **Appendix A: Post-ECP Year 1 Detailed Savings Calculations and Reconciliation**
- **Appendix B: Post-ECP Year 1+N Detailed Savings Calculations and Reconciliation**



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# ***AF M&V, LIGHTING***

## **■ Appendix C: Forms**

**C.1. Sampling Plan**

**C.2. Data Worksheet**

**C.3. Operating Schedule Worksheet**

**C.4. Measurement Specifications and Costs Worksheet**

**C.5. Acceptance Checklist Worksheet**

**C.6. Acceptance Checklist Worksheet**

**C.7. Year 1 Detailed Savings Worksheet**

**C.8. Year “1+N” Detailed Savings Worksheet**



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# ***AF M&V, LIGHTING***

- **Sampling Plan (C.1.) Excerpt**
  - **Percent (%) sampled determined by USAF with consideration to the confidence of the measurement . This sample should provide a confidence of 80% with a precision of +/- 20% or better. Figure C.1. Provides the required sample size with respect to population.**
  - **If the first sample fails then another sample should be taken with a sample sized to provide a confidence of 90% and a precision of 20%.**
  - **If the second sample fails 100% of the items will be tested.**



## ■ Sampling Plan (C.1.) Table C.1.

Precision	20%	20%	10%
Confidence	80%	90%	90%
Population Size, N	Sample Size, n		
4	3	4	4
12	6	8	11
20	8	10	16
30	9	11	21
40	9	12	26
50	10	13	29
60	10	14	32
70	10	15	35
80	10	15	37
90	10	15	39
100	10	15	41
200	11	16	51
300	11	17	56
400	11	17	59
500	11	17	60
Infinite	11	17	68

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**That's all Folks**

**Questions??????**



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